

25. NCBI C++ Toolkit Source Browser

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Source Browsers

The overview for this chapter consists of the following topics:

- Introduction
- Chapter Outline

Introduction

The NCBI C++ Toolkit source code is highly browseable and can be searched in a variety of useful ways. To that end we provide two source browsers, one based on the LXR Engine and the other uses the DOC++ software. These are complementary approaches, the former allowing the Toolkit source to be searched and navigated according to its file hierarchy and the latter presenting an alphabetical list of all classes, macros, variables, typedefs, etc. named in the Toolkit and a summary of the parent-child relationships among the classes.

Chapter Outline

The following is an outline of the topics presented in this chapter:

- LXR
- Doxygen Browser
- DOC++ Browser

LXR

The LXR Engine [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/lxr/blurb.html] enables search-driven browsing together with a more conventional navigation [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/lxr/source/] of the Toolkit's source. In "source" [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/lxr/source/] mode, LXR provides navigation of the source tree through a web-based front end. The LXR search modes "ident" [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/lxr/ident/], "find" [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/lxr/find/] and "search" [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/lxr/search/] will generate a list to identify all occurrences in the Toolkit where an identifier, file name, or specified free text, respectively, are found.

An *identifier* in an LXR search is the name of a class, function, variable, macro, typedef, or other named entity within the Toolkit source. This search can be especially handy when attempting to determine, for example, which header has been left out when a symbol reference cannot be found.

Some hints for using LXR:

- For freetext LXR searches, patterns, wild cards, and regular expression syntax are allowed. See the search help page [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/lxr/search_help.html] for details.
- The identifier ("ident") and file ("find") LXR search modes attempt an **exact** and **case-sensitive** match to your query.
- LXR indexes files from a root of *\$NCBI/c++*, matches will be found not only in *src* and *include*, but any resident build tree and the *compilers* and *scripts* directories as well.
- **NB:** The documentation itself is not searched by LXR.

Doxygen Browser

The Doxygen tool has been used to generate a toolkit source code browser [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/doxyhtml/index.html] from the source code files. The documentation is extracted directly from the sources, which makes it much easier to keep the documentation consistent with the source code. Doxygen has been configured to extract the code structure directly from the source code files. This feature is very useful as it quickly enables you to find your way in large source distributions. You can also visualize the relations between the various elements by means of dependency graphs, inheritance diagrams, and collaboration diagrams, which are all generated automatically.

DOC++ Browser

- Entity Index [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/docxx/index.html] (alphabetical list)
- Class Relationships [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/docxx/HIER.html] (alphabetical ordering)

A second web-based browser, DOC++ [<http://docpp.sourceforge.net/>], presents a complementary view onto the Toolkit's class relationships [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/docxx/HIER.html], complete with cross references and links to parent and child classes. An alphabetical listing of all Toolkit classes is also presented by DOC++ (although that listing does not separately list any child classes). In-page inheritance relationships are displayed

graphically with a Java Applet on each class' page. The DOC++ class descriptions also provide links that invoke the LXR search capabilities so that one may easily trace the usage of any class throughout the Toolkit (and avoid the typos that frustrate LXR).

DOC++'s index list [http://www.ncbi.nlm.nih.gov/IEB/ToolBox/CPP_DOC/docxx/index.html], also alphabetical, not only gives all of the Toolkit classes, but itemizes most any other entity used within the Toolkit. Here is the complete list, in the order presented by DOC++:

- Classes
- Functions
- Variables
- Macros
- Enums, Unions, Structs
- Typedefs

(Unfortunately links directly to each entity type are not currently available in the main listing.) Each entry is linked to LXR so you can quickly find all of its occurrences in the Toolkit.

Specific hints to locate and browse serializable objects have been detailed elsewhere.